AMENDMENTS TO THE SPECIFICATION:

Page 1, line 11, please insert as follows:

BACKGROUND OF THE INVENTION

Page 2, line 31, please insert as follows:

SUMMARY OF THE INVENTION

Page 15, line 3, please insert as follows:

BRIEF DESCRIPTION OF THE DRAWINGS

Page 15, line 20, please insert as follows:

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Page 6, please amend the paragraph beginning at line 24 as follows:

In one embodiment, in the comparing step it is determined whether the model represents a signal due to the phenomenon in dependence upon the number of components which are determined to represent a signal due to the phenomenon. For example, where signal is expected to comprise a response from a sample having a number of distinct responses, or a response with a particular structure or shape, the model may only be determined to represent a response from the sample if a certain number of those responses and/or their structure or shape are determined to be present. By shape it is meant a particular envelope on the FID (Free Induction Delay), or the shape of the signal in the frequency domain. By this arrangement, the accuracy

with which it may be determined that the model represents a signal due to the phenomenon may be improved. This embodiment is analogous to the "signature detection" technique described in WO 92/21989 cited above (see, for example, page 15 line 15 to page 18 line 15 of that document).

Page 33, please amend the paragraph beginning at line 20 as follows:

In order to compare the present techniques with the performance of a matched filter, parametric LP was implemented in MATLAB using the function LPSVD, and tests were carried out using the 870 kHz line of TNT. In the LP function, the linear prediction order *L* was set to either *N*/3 or *N*/4, these values being suited to the processing of noisy signals. Figure 4 shows the original time domain data, which had a SNR of about 5. The Fourier Transformation (FT) of these data is shown in Figure 5, with the QR response at -2 kHz on the frequency scale. Figure 6 shows the original time domain data multiplied by a matched filter with a time constant of 1.5 ms; the SNR has improved by a factor of about 20. Figure 7 shows the FT of the data of Figure 6. Figure 8 shows the LPSVD signal in the time domain with $M = 1$, and Figure 9 shows the FT. In this case the program has selected the correct component as the signal. Figure ~~10~~ 11 shows the time domain LPSVD signal with $M = 8$; the signal is a better fit to the actual FID, as shown in Figure 3. The Fourier Transformation is shown in Figure ~~10~~11. The noise components are evident, but clearly distinguished from the true signal by their line width, frequency and phase. At higher values of *M*, the clutter in the FT spectrum renders a visual inspection almost impossible, but the true signal may be distinguished by comparison of the parameter values with predetermined values of the parameters.